

Catalogue of American Amphibians and Reptiles.

WEBB, ROBERT G. 1973. *Trionyx spiniferus*.

***Trionyx spiniferus* Lesueur**
Spiny softshell turtle

Trionyx spiniferus Lesueur, 1827:258. Type-locality, "Newharmony, sur le Wabash" [Wabash River, New Harmony, Posey County, Indiana]. Lectotype, Mus. d'Hist. Nat. Paris 8808, large stuffed female, obtained by Charles A. Lesueur (not examined by author).

Trionyx ocellatus Lesueur, 1827:261. Type-locality, "Newharmony, sur le Wabash" [Wabash River, New Harmony, Posey County, Indiana]. Lectotype, Mus. d'Hist. Nat. Paris 6957, adult male, obtained by Charles A. Lesueur (not examined by author). See Comment.

Apalone Hudsonica Rafinesque, 1832:64. Type-locality, "River Hudson between the falls of Hadley, Glen and Baker, and further up to the source," restricted to the Hudson River, near Baker's Falls, Saratoga County, New York (Webb, 1962). Type not known to exist. See Comment.

Gymnopus Spiniferus: Duméril and Bibron, 1835:477. First use of combination.

Trionyx annulifer Wied-Neuwied, 1839:140 (footnote). Type-locality, not stated, restricted to "Ohio River at Pittsburgh, Pennsylvania" (Stejneger, 1944). Type not known to exist.

Tyrse Argus Gray, 1844:48. Type-locality, "West Africa; Sierra Leone?"; designated "New Harmony, Indiana" by Schmidt (1953). Holotype, British Museum (Nat. Hist.) 43.9.6.12, stuffed (Gray, 1873), received from Earl of Derby (not examined by author).

Trionyx Argus: Gray, 1855:68. First use of combination.

Trionyx annulatus: Gray, 1855:69. Lapsus for *annulifer* (as synonym of *Trionyx ferox*).

Aspidonectes spinifer: Agassiz, 1857:403. First use of combination, but proposed earlier by Wagler (1830).

Aspidonectes asper Agassiz, 1857:405. See *T. s. asper*.

Aspidonectes nuchalis Agassiz, 1857:406. Type-locality, "Cumberland River . . . head waters of the Tennessee River," restricted to "Cumberland river, Tenn." by Baur (1893) and to Cumberland River, near Nashville, Tennessee by Schmidt (1953). Lectotype, Mus. Comp. Zool. 1623, large female, received from Prof. Lindsley of Nashville (examined by author).

Aspidonectes Emoryi Agassiz, 1857:407. See *T. s. emoryi*.

?*Gymnopus* *olivaceus* Wied-Neuwied, 1865:55. Substitute name for *Trionyx ocellatus* Lesueur, 1827.

Callinia spinifera: Gray, 1869:222. First use of combination.

Platypeltis Agassizii Baur, 1888:1121. See *T. s. asper*.

P[latypeltis] spinifer: Baur, 1893:220. First use of combination.

P[latypeltis] nuchalis: Baur, 1893:220. First use of combination.

Amyda spinifera: Hurter, 1911:251. First use of combination.

• **CONTENT.** Six subspecies are recognized: *spiniferus*, *hartwegi*, *asper*, *pallidus*, *guadalupensis*, and *emoryi*.

• **DEFINITION.** A moderate-sized species of *Trionyx* with the maximal size of females (carapace length near 47 cm) exceeding that of males (near 24 cm). Ridges are present on the nasal septum. A marginal ridge is lacking on the carapace. The surface of the carapace in adult males is gritty or "sand-papery" to touch. The anterior edge of the carapace varies in adults (depending on subspecies) from being relatively smooth to having prominent conical tubercles. The juvenile pattern on the carapace (young and adult males) varies in the subspecies, consisting either of dark ocelli or dots, or of white dots. The basic head pattern of pale postocular stripes and inverted Y on top of snout also varies in the subspecies. Females acquire a mottled, lichen-like pattern (not coincident with sexual maturity).

• **DESCRIPTIONS.** Webb (1962) provided detailed descriptions of external morphology, color pattern, and proportions, including individual, ontogenetic, sexual, and geographic variation, and descriptions of skull, carapace and plastron. He also provided descriptions of all six subspecies.

• **ILLUSTRATIONS.** Photographs of juveniles, adult males and females of all six subspecies, including the types of *T. s. spiniferus*, *T. s. pallidus*, *T. s. guadalupensis* and skull of *Platypeltis*

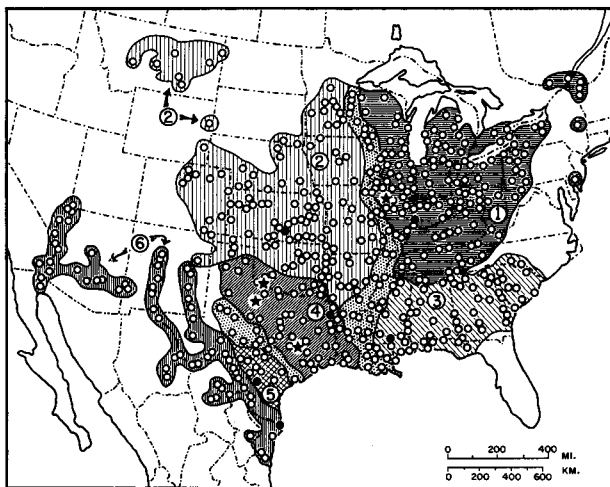
agassizii holotype, habitats of some subspecies, line drawings of dorsal surface of snout, side of head, hind foot, and anterior edge of carapace of most subspecies, as well as line drawings of the bony carapace, plastron, and aspects of the skull are in Webb (1962). Type specimens are illustrated by Conant and Goin (1948), Lesueur (1827), Webb (1960), and Wied-Neuwied (1865). Various anatomical features are illustrated by Albrecht (1967), Baird (1970), Parsons (1968, 1970), and Sachsse (1969). Smith, Nixon, and Minton (1949) provide photographs of a melanistic female.

• **DISTRIBUTION.** *Trionyx spiniferus* is the most widespread species of the genus in North America, occurring over most of the eastern United States. The species ranges from southeastern Canada (Quebec and Ontario) and Montana south to the Carolinas and Georgia (avoiding peninsular Florida and most of the Atlantic seaboard), and to New Mexico, extending into northeastern Mexico (Chihuahua, Coahuila, Nuevo León, and Tamaulipas). The species has been successfully introduced in New Jersey and into the Gila-Colorado River drainage in Arizona.

Records of occurrence depicted on the distribution map include those in Webb (1962) and only additional records that are peripheral and tend to delimit the geographic range of the species. Additional records include Lovrity and Denman (1966, Quebec), Black and Black (1971, Montana), Fishbeck and Underhill (1959, South Dakota), Smith, Maslin, and Brown (1965, Colorado), Christiansen (1961, Iowa), Hahn and May (1972, Arizona), Brown (1968, New Mexico), Raun and Gehlbach (1972, Texas), Baker and Webb (1967, Tamaulipas), W. G. Degenhardt (*in litt.*, New Mexico), G. R. Zug (*in litt.*, Garrett Co., Maryland), W. M. Palmer (*in litt.*, Madison Co., North Carolina), Glaser (1970, Salton Sea, California) and Winokur (1968, Pinal Co., Arizona; Reeves Co., Texas; and, Rio San Fernando, Tamaulipas, México). Many collectors have given new records to Conant (*in litt.*, Charles Mix Co., South Dakota; Washington Co., Utah; Crawford Co., Michigan; Lee Co., Virginia; and, Anson and Mecklenburg cos., North Carolina).

• **FOSSIL RECORD.** Excluding reports in which fossil fragments of *Trionyx* are not identified to species, *T. spiniferus*, known only from Pleistocene deposits, is reported from Brazos (same fossil listed from Burleson Co. by Gehlbach, 1965) and Knox counties, Texas (Holman, 1969), Tillman County, Oklahoma (Gehlbach, 1965), and Sangamon County, Illinois (Holman, 1966).

• **PERTINENT LITERATURE.** The most recent taxonomic treatment of *T. spiniferus* is by Webb (1962), who discusses relationships with other American species and summarizes life history information. Additional papers (not cited in Webb, 1962) nesting habits (Vose, 1964; species probably *spiniferus*), eggs (Bush, 1959), basking habits (Boyer, 1965, as *ferox*), ecology (Stewart, 1961), righting reflex (Ashe, 1970),



MAP. Solid circles mark type-localities; open circles indicate other records. Stars mark fossil localities. Stippled areas indicate areas of intergradation.

behavior (Lardie, 1964), size record for *T. s. pallidus* (Lardie, 1963), color preferences (Ernst and Hamilton, 1969; but see Hailman and Jaeger, 1971), length-weight relationship (Dunson, 1967b), anatomy and other topics (Stockwell, 1888), cranial arteries and foramina (Albrecht, 1967), nasal embryology (Parsons, 1959, 1971), choanal papillae (Parsons, 1968), pelvic girdle, buoyancy, locomotion (Zug, 1971), mechanical function of plastron (Richmond, 1964), hyoid movement in diving turtles (Dunson, 1966), hyoid apparatus (Siebenrock, 1899), water exchange (Bentley and Schmidt-Nielsen, 1970), sodium metabolism (Dunson, 1967a; Dunson and Weymouth, 1965), plasma electrolytes (Dessauer, 1970), serum proteins-relationships (Frair, 1964, 1969, 1972), critical thermal maximum (Hutchison, Vinegar, and Kosh, 1966), number of erythrocytes (Hutchison and Szarski, 1965), erythrocyte diameter (Szarski and Czopek, 1966), karyotype analysis (Forbes, 1967), dispersal barrier in Florida (Blaney, 1971), and Quaternary speciation (Auffenberg and Milstead, 1965).

• **ETYMOLOGY.** The name *spiniferus* from Latin *spina* means thorn and refers to the spine-like, conical tubercles along the anterior edge of the carapace in some subspecies; *hartwegi* is a patronym in honor of the late Dr. Norman E. Hartweg, herpetologist at the University of Michigan; *asper* (Latin) means rough or harsh and alludes to the occasional rounded or wartlike prominences on the posterior part of the bony carapace of large females; *pallidus* (Latin) means pale and refers to the juvenile pattern that is either uniformly pale gray or tan, or consists only of whitish dots; *guadalupensis* is a geographical name referring to the Guadalupe River in Texas; *emoryi* is a patronym honoring William Hemsley Emory, Major, U. S. Army, Corp of Topographical Engineers, who was associated most prominently with the Mexican Boundary Survey.

1. *Trionyx spiniferus spiniferus* Lesueur

Trionyx spiniferus Lesueur, 1827:258. See species account.
Trionyx ocellatus Lesueur, 1827:261. See species account.
Apalone Hudsonica Rafinesque, 1832:64. See species account.
Trionyx annulifer Wied-Neuwied, 1839:140. See species account.
Tyrse Argus Gray, 1844:48. See species account.
Aspidonectes nuchalis Agassiz, 1857:406. See species account.
?Glymnopus olivaceus Wied-Neuwied, 1865:55. See species account.
Amyda spinifera spinifera: Stejneger and Barbour, 1939:172. First use of trinomial, but implied earlier by Siebenrock (1924).
Trionyx spinifera spinifera: Cagle, 1941:23. Transfer to *Trionyx*.
Amyda ferox spinifera: Neill, 1951:15. Species *spiniferus* considered conspecific with *ferox*.
Trionyx ferox spinifera: Schmidt, 1953:109. Transfer to genus *Trionyx*.

• **DEFINITION.** The juvenile pattern on the carapace consists of large, well-defined, thick-bordered, black ocelli (largest toward center of carapace), and one dark marginal line demarcating the pale rim of the carapace. The hands and feet are coarsely dark-patterned. The tubercles on the anterior edge of the carapace (minute prominences in hatchlings) are large and conical in adults, especially females.

• **REMARKS.** The introduction of *T. s. spiniferus* into New Jersey is discussed by Conant (1961). The northeasternmost part of the range in the Lake Champlain area and Ottawa River drainage in adjacent Ontario and Quebec seems to be disjunct (Conant, *in litt.*, based on discussions with Francis Cook). Softshell turtles are now probably extinct in the lower Mohawk-Hudson River drainage in New York, so that old records from Albany County (Webb, 1962) represent a former distribution (Conant, *in litt.*); a relatively recent record from Saratoga County (Conant, 1961) is depicted as an isolate on the map.

2. *Trionyx spiniferus hartwegi* (Conant and Goin)

Amyda spinifera hartwegi Conant and Goin, 1948:1. Type-locality, "Wichita, Sedgwick County, Kansas." Holotype, Univ. Michigan Mus. Zool. 95365, adult male, obtained by Robert Young in late May, 1945 (examined by author).
Amyda ferox hartwegi: Neill, 1951:15. Species *spiniferus* considered conspecific with *ferox*.
Trionyx ferox hartwegi: Schmidt, 1953:110. Transfer to genus *Trionyx*.

T[ri]onyx s[pinifer] hartwegi: Schwartz, 1956:11. *T. ferox* and *T. spiniferus* regarded as distinct species.

• **DEFINITION.** Same as *T. s. spiniferus*, except for juvenile pattern on carapace of small ocelli and/or usually small black spots.

• **REMARKS.** The virtual lack of records in the Missouri River drainage of North and South Dakota suggests that the Montana population and a record from Beaver Creek (in the Cheyenne-Missouri drainage), Weston County, Wyoming are disjunct. Conant (*in litt.*) called my attention to data (Bailey and Allum, 1962) indicating stream capture and interchange of fauna between the upper Platt and upper Missouri rivers.

3. *Trionyx spiniferus asper* (Agassiz)

Aspidonectes asper Agassiz, 1857:405. Type-locality, none stated; designated "Lake Concordia, La." (Baur, 1893), but restricted to "Pearl River at Columbus, Marion County, Mississippi" (Webb, 1960). Lectotype, Mus. Comp. Zool. 1597, large adult female, received from Mr. Winthrop Sargent of Natchez, Mississippi (examined by author).
Platypeltis Agassizii Baur, 1888:1121. Type-locality, none stated, but later designated as "Western Georgia" by Baur (1893); suggested as "Savannah, Georgia, on the lower Savannah River" by Neill (1951), and so restricted, "Savannah . . . Savannah River," by Schwartz (1956). Holotype, Mus. Comp. Zool. 37172, adult female consisting of shell, skull and limb bones (skull examined by author). See Remarks.
Trionyx agassizii: Hay, 1892:144. Transfer to genus *Trionyx*.
P[elodiscus] agassizii: Baur, 1893:218. Transfer to genus *Pelodiscus*.
P[latypeltis] asper: Baur, 1893:220. Transfer to genus *Platypeltis*.
Aspidonectes agassizii: Jordan, 1899:206. Transfer to genus *Aspidonectes*.
Trionyx spiniferus agassizii: Siebenrock, 1924:188. First use of trinomial.
Amyda agassizii: Stejneger and Barbour, 1939:171. Transfer to genus *Amyda*.
Amyda spinifera aspera: Stejneger and Barbour, 1939:172. First use of combination.
Amyda ferox agassizii: Neill, 1951:15. Species *spiniferus* considered conspecific with *ferox*.
Amyda ferox aspera: Neill, 1951:15. Species *spiniferus* considered conspecific with *ferox*.
Trionyx ferox agassizii: Schmidt, 1953:109. First use of combination.
Trionyx ferox aspera: Schmidt, 1953:109. First use of combination.
Trionyx spinifer asper: Schwartz, 1956:17. First use of combination.

• **DEFINITION.** Same as *T. s. spiniferus*, except for juvenile pattern of black spots, dots, small ocelli or a combination thereof, and usually two or three, sometimes four, dark marginal lines posteriorly on the carapace, the innermost lines interrupted. The pale postocular and postlabial stripes often are united on the side of the head.

• **REMARKS.** The taxonomic history of the synonym *Platypeltis agassizii* Baur is discussed in Stejneger (1944) and Webb (1962). *P. agassizii* was distinguished by features of the skull, mainly the widened crushing surfaces of the maxillae. This condition, occurring in softshells (presumably large females) in Atlantic drainages of South Carolina and Georgia, requires further study.

4. *Trionyx spiniferus pallidus* Webb

Trionyx spinifer pallidus Webb, 1962:522. Type-locality, "Lake Caddo, Caddo Parish, Louisiana." Holotype, Tulane Univ. 484, adult male, obtained by Fred R. Cagle and party on June 27, 1947 (examined by author).

• **DEFINITION.** The juvenile pattern on the carapace consists of small white dots that are most conspicuous posteriorly (indistinct or absent anteriorly). The white dots are not narrowly ringed with black in adult males. Some hatchlings and young have a uniform pale tan or brown carapace. The tubercles along the anterior edge of the carapace in adults are equilateral or conical in shape.

5. *Trionyx spiniferus guadalupensis* Webb

Trionyx spinifer guadalupensis Webb, 1962:517. Type-locality, "15 miles northeast Tilden, McMullen County, Texas." Holotype, Univ. Michigan Mus. Zool. 89926, adult male (examined by author).

• DEFINITION. The juvenile pattern on the carapace consists of large white dots and spots that are conspicuous anteriorly as well as posteriorly. The white dots are narrowly ringed with black in adult males. The tubercles along the anterior edge of the carapace in adults are rounded and wartlike, not conical.

6. *Trionyx spiniferus emoryi* (Agassiz)

Aspidonectes Emoryi Agassiz, 1857:407. Type-locality, "lower Rio Grande of Texas, near Brownsville." Lectotype, U. S. Natl. Mus. 7855, young, obtained in the course of the Mexican Boundary Survey under the command of Major William H. Emory (examined by author).

Trionyx emoryi: Boulenger, 1889:258. Transfer to genus *Trionyx*.

P[latypeltis] emoryi: Baur, 1893:220. Transfer to genus *Platypeltis*.

Amyda emoryi: Stejneger and Barbour, 1917:124. Transfer to genus *Amyda*.

Amyda ferox emoryi: Neill, 1951:15. First use of trinomial.

Trionyx ferox emoryi: Schmidt, 1953:109. First use of combination.

T[trionyx] s[spinifer] emoryi: Schwartz, 1956:11. First use of combination.

• DEFINITION. The juvenile pattern of small white dots (not ringed with black) is confined to the posterior third of the carapace. The pale rim of the carapace is conspicuously widened posteriorly, four to five times wider than laterally. A straight or slightly curved, dark line (rarely interrupted) connects the anterior margins of the orbits. The pale postocular stripe is usually interrupted. The tubercles on the anterior edge of the carapace in adults are low, rounded prominences.

• REMARKS. Hybridization occurs with *T. ater* in central Coahuila (Winokur, 1968). The introduction of *T. s. emoryi* in the Gila-Colorado river drainage of Arizona is discussed by Webb (1962). The occurrence of *T. s. emoryi* in southeastern Arizona and adjacent Sonora (map in Stebbins, 1954) is later rejected (map in Stebbins, 1966).

COMMENT

The specific names *spinifer* and *spiniferus* have been used interchangeably for many years, and no distinction is made in the synonymy. Use of the specific name *spinifer* (Agassiz, 1857; Schwartz, 1956; Webb, 1962) is discussed by Smith, Williams, and Moll (1963) and Smith, Maslin, and Brown (1965), who regard *spiniferus* as the proper spelling. Synonyms of *Trionyx spiniferus* are discussed by Webb (1962). A fairly complete synonymy, including orthographic changes, is given by Stejneger (1944). *Trionyx ocellatus* Gray, 1830 (= *Trionyx hurum* Gray, 1831) is a homonym of the earlier-named *Trionyx ocellatus* Lesueur, 1827.

Two generic names, *Apalone* Rafinesque (1832) and *Callinia* Gray (1869), have been proposed with *Trionyx spiniferus* Lesueur as the type-species. The oldest name, *Apalone*, is dismissed in favor of *Callinia* (Smith and Smith, 1963). *Trionyx spiniferus* Lesueur was designated as the type-species of *Callinia* by Stejneger (1907).

The subspecies *spiniferus* and *hartwegi* intergrade along the Mississippi River valley (probably over a wider area than shown on map) and with *asper* and *pallidus* in southern Louisiana; there is only slight evidence of intergradation with *asper*. The subspecies *pallidus* and *guadalupensis* form an east-west cline (in pattern and size of tubercles on the anterior edge of carapace) that is stepped between the Brazos and Guadalupe-San Antonio river drainages; records of softshells from the Colorado river drainage are considered intergrades on the distribution map. *Trionyx s. emoryi*, confined to the Río Grande drainage, is sharply distinguished from *T. s. guadalupensis* adjacent eastward in the Nueces River drainage.

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